



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,541	06/25/2003	Jesper B. Lind	MS180583.1/MSFTP433US	4073
27195 7590 02/26/2008 AMIN, TUROCY & CALVIN, LLP 24TH FLOOR, NATIONAL CITY CENTER 1900 EAST NINTH STREET CLEVELAND, OH 44114				
EXAMINER ROBERTSON, DAVID				
ART UNIT		PAPER NUMBER		
3623				
NOTIFICATION DATE		DELIVERY MODE		
02/26/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

doctet1@thepatentattorneys.com
hholmes@thepatentattorneys.com
osteuball@thepatentattorneys.com

Office Action Summary

Application No.

10/603,541

Applicant(s)

LIND ET AL.

Examiner

Dave Robertson

Art Unit

3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-149 is/are pending in the application.
- 4a) Of the above claim(s) 5-100 and 102-149 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 101 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-149 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI-08)
Paper No(s)/Mail Date 8/27/03 4/3/06

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This is a Non-final First Office Action on the Merits on claims 1-149.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
- I. Claims 1-128, drawn to methods for collaborative filtering using measures of association and data smoothing algorithms, classified in class 705, subclass 10. Election of Group I will result in further restriction to the following subgroups:
- i. Claims 1-4 and 101, drawn to methods and a system for collaborative filtering using Lift and cutoff smoothing, classified in class 705/10.
 - ii. Claims 5-8 and 102, drawn to methods and a system for collaborative filtering using Lift and prior on counts smoothing, classified in class 705/10.
 - iii. Claims 9-12 and 103, drawn to methods and a system for collaborative filtering using Lift and information priors smoothing, classified in class 705/10.
 - iv. Claims 13-16 and 104, drawn to methods and a system for collaborative filtering using Lift and non-uniform priors smoothing, classified in class 705/10.

- v. Claims 17-20 and 105, drawn to methods and a system for collaborative filtering using Weight of Evidence and cutoff smoothing, classified in class 705/10.
- vi. Claims 21, 22 and 106, drawn to methods and a system for collaborative filtering using Weight of Evidence and prior on counts smoothing, classified in class 705/10.
- vii. Claims 23-26 and 107, drawn to methods and a system for collaborative filtering using Weight of Evidence and information priors smoothing, classified in class 705/10.
- viii. Claims 27-30 and 108, drawn to methods and a system for collaborative filtering using Weight of Evidence and non-uniform priors smoothing, classified in class 705/10.
- ix. Claims 31-34 and 109, drawn to methods and a system for collaborative filtering using Yule Q and cutoff smoothing, classified in class 705/10.
- x. Claims 35, 36 and 110, drawn to methods and a system for collaborative filtering using Yule Q and prior on counts smoothing, classified in class 705/10.
- xi. Claims 37-40 and 111, drawn to methods and a system for collaborative filtering using Yule Q and information priors smoothing, classified in class 705/10.

- xii. Claims 41-44 and 112, drawn to methods and a system for collaborative filtering using Yule Q and non-uniform priors smoothing, classified in class 705/10.
- xiii. Claims 45-48 and 113, drawn to methods and a system for collaborative filtering using Tau and cutoff smoothing, classified in class 705/10.
- xiv. Claims 49, 50 and 114, drawn to methods and a system for collaborative filtering using Tau and prior on counts smoothing, classified in class 705/10.
- xv. Claims 51-54 and 115, drawn to methods and a system for collaborative filtering using Tau and information priors smoothing, classified in class 705/10.
- xvi. Claims 55-58 and 116, drawn to methods and a system for collaborative filtering using Tau and non-uniform priors smoothing, classified in class 705/10.
- xvii. Claims 59-62 and 117, drawn to methods and a system for collaborative filtering using Phi and cutoff smoothing, classified in class 705/10.
- xviii. Claims 63, 64 and 118, drawn to methods and a system for collaborative filtering using Phi and prior on counts smoothing, classified in class 705/10.

- xix. Claims 65-68 and 119, drawn to methods and a system for collaborative filtering using Φ and information priors smoothing, classified in class 705/10.
- xx. Claims 69-72 and 120, drawn to methods and a system for collaborative filtering using Φ and non-uniform priors smoothing, classified in class 705/10.
- xxi. Claims 73-76 and 121, drawn to methods and a system for collaborative filtering using Cross-Product and cutoff smoothing, classified in class 705/10.
- xxii. Claims 77, 78 and 122, drawn to methods and a system for collaborative filtering using Cross-Product and prior on counts smoothing, classified in class 705/10.
- xxiii. Claims 79-82 and 123, drawn to methods and a system for collaborative filtering using Cross-Product and information priors smoothing, classified in class 705/10.
- xxiv. Claims 83-86 and 124, drawn to methods and a system for collaborative filtering using Cross-Product and non-uniform priors smoothing, classified in class 705/10.
- xxv. Claims 87-90 and 125, drawn to methods and a system for collaborative filtering using Log of cross-product and cutoff smoothing, classified in class 705/10.

xxvi. Claims 91, 92 and 126, drawn to methods and a system for collaborative filtering using Log of cross-product and prior on counts smoothing, classified in class 705/10.

xxvii. Claims 93-96 and 127, drawn to methods and a system for collaborative filtering using Log of cross-product and information priors smoothing, classified in class 705/10.

xxviii. Claims 97-100 and 128, drawn to methods and a system for collaborative filtering using Log of cross-product and non-uniform priors smoothing, classified in class 705/10.

- II. Claims 129-149, drawn to systems for collaborative filtering, the systems delivered on various platforms in various computer-related embodiments, classified in class 705, subclass 10. Election of Group II may result in further restriction if claims are later amended to recite details of the various platforms and computer-related embodiments.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions of Groups I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II is separately useable as a system implemented on a specific computer-related platform or as a specific computer-related embodiment and has separate utility such as providing

collaborative filtering in a variety of computer hardware and software delivery modes.

See MPEP § 806.05(d).

4. Inventions of Group I subgroups i through xxviii are each related to the other as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, each of subcombinations of subgroups i to xxviii has separate utility to each of the other subgroups, such as scoring items in an item set using a *specific* measure of association and a *specific* data smoothing algorithm, each pairing of a specific measure of association with a specific data smoothing algorithm. In the specification of the instant invention, each combination of association and smoothing algorithms is disclosed as having separate utility according the aspect of similarity, probability, or popularity, and the data smoothing required, selected and utilized by the filtering component (see Specification page 15 from line 19 to page 16 line 29). See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to

provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

5. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;
- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention.**

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

6. During a telephone conversation with Attorney Vahid Sharifi Takieh (#45828) on 1/10/2008 a provisional election was made without traverse to prosecute the invention of Group I, subgroup i, claims 1-4 and 101. Affirmation of this election must be made by applicant in replying to this Office action. Claims 5-100 and 102-149 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

7. Claims 1-4 are objected to because of the following informalities: Claim 1 at "wherein the filtering component additionally employing..." should read "additionally employs[ing]". Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-4 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-4 recite a *system* having only one component *a filtering component*. A system is generally understood as a collection of interrelated components defined by the functions or steps or acts performed by the components and the result of their interaction. However, the invention as claimed recites one component without interrelationship to any claimed or unclaimed part of any *system*. Further, the invention recites *a filtering component that employs...and utilizes...* methods for scoring. However, *employing* and *utilizing* do not positively recite functional operations or steps or acts of the filtering component.

Because the claims recite no functional operation or steps or acts of the filtering component, neither the statutory class of invention nor the metes and bounds of the claimed invention can be readily determined. However, for purposes of examination the

claims will be interpreted as best can be determined from a reading of the claims in light of the specification, giving a broadest reasonable interpretation to *a system comprising a filtering component that employs...and utilizes...methods for scoring.*

10. Appropriate amendment or clarification is requested.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claims 1-4 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The statutory class of invention for patentability must be one of product, process, machine or manufacture. As noted above under 35 USC 112, 2nd paragraph, the statutory class of a *system comprising a filtering component that employs...and utilizes methods of scoring, lacking functional steps or acts and interrelationship of components, cannot be determined. Because no statutory class can be readily determined, the invention as claimed is nonstatutory for failure to claim one of a product, process, machine or manufacture.*

Furthermore, even giving weight to the claims as *suggesting* the functional acts or steps and interrelationships of the filtering component from the specification (see Figure 2, for example) claims to a *filtering component that employs Lift, smoothed...for scoring an item*, suggest a mathematically algorithm per se without practical application.

That is, the claims suggest a mathematical algorithm, an abstract idea, i.e. a judicial exception to patentable subject matter, without physical transformation and lacking a useful, concrete, and tangible result, as *scoring an item from an item set* is a mathematical result per se having no *real-world* association thus fails at least to provide a *tangible* result to the claim as a whole.

Further still, because the specification defines the term "component" (see page 17 from line 27), as "a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution...for example, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and a computer" claims reciting a filtering component encompasses at least one nonstatutory embodiment of invention, that is: *software per se*.

On at least these grounds above, the claims are rejected as nonstatutory subject matter.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1, 3 and 101 are rejected under 35 U.S.C. 102(b) as being anticipated by Linden et al. (US Pat. No. 6,216,649).

Linden discloses automated collaborative item recommendation methods and a system using item-to-item similarity measures to determine a set of items to present to customers of the Amazon.com website.

Specifically, with respect to the claims presented:

Claim 1

Linden teaches a collaborative filtering system, comprising a filtering component (see Figure 1 Item 44) that employs Lift (see column 5 from line 57; column 9 from line 34; column 13 from line 14: "Lift" as defined by instant invention) smoothed via a cutoff smoothing technique (see column 13 from line 47; esp. column 12 from line 26: "items that were sold to an insignificant number (e.g. <15) of customers are preferably omitted or deleted from the tables") as a measure of association for scoring at least one item of an item set (see Abstract, Figure 7 and related discussion); wherein the filtering component additionally employs at least one multiple-score collaborative filtering evaluation method to obtain a single score for an item when more than one measure of association score applies to that item (see column 9 from line 34 and column 11 from

line 16: multiple similarity measures weighted by a commonality index and scored resulting in multiple similarity lists generated from multiple or alternative measures of association are merged in order of highest to lowest score, thereby selecting a single score for an item on the list when more than one measure of association applies).

Claims 3 and 101

Linden teaches claim 1 as above, and further employing (utilizing) a highest value score of scores applicable to an item as the single score (see column 9 from line 34 and column 11 from line 16, esp. column 15 from line 16: similar item lists obtained from multiple measures of association are scored and combined or merged base on the highest value score applicable to common items on the item set.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linden et al. (US Pat. No. 6,216,649) as applied above to claim 1 and further in view of Bradley et al (US Pat. No. 7,194,477).

Claims 2 and 4 recite the system of claim 1 and claim 3, respectively, and further wherein the item set comprising a higher-order item set wherein more than one item is represented on a left-hand side of an association rule applicable to at least one item in

the item set. Linden teaches claims 1 and 3 as above; however, Linden does not expressly teach *rules having higher-order tem sets*.

Linden teaches recommendations based on sets of items (in a basket of items or "shopping cart") and determining what items of an item list to recommend based on the scores of multiple items in association with an item of interest (the list item), the multiple items combined being a stronger indicator of interest based on the users current shopping experience (see column 16, top). Bradley expressly teaches association rules for "occurrence data" having multiple items on the left side of the rule, the rule defining an association based on multiple items associated to a single item of interest (see Bradley, at least column 2 from line 18 and related formulations at column 12 from line 59 to column 13. line 24). It would have been obvious to one of ordinary skill in the art at the time of the invention that an item set comprising a higher-order item set wherein more than one item is represented on a left-hand side of an association rule applicable to at least one item in the item set, as suggested by Linden and taught by Bradley, would provide a stronger indication of interest in an item and therefore lead to higher acceptance of recommendations, especially in the case of a shopping cart where items.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Pyo (US 6,636,836) teaches automated methods for recommending items based on multiple recommendation components, weighting component recommendations by an influence factor.

Harper et al. (US 2008/0015953) teaches automated methods for collaboration filters including implementation on a variety of hardware and software platforms (see Figure 2).

Jacobi et al. (US 7,113,917) teaches automated methods of making personalized recommendations of items based on similarity and popularity of other items.

Chickering et al. (US 6,831,663) teaches automated methods for making and explaining probabilistic predictions in collaborative filtering systems.

Oldale et al. (US 2004/0054572) teaches automated methods for improving on model-based collaborative filtering using item profiles.

Linden et al. (ACM, 2003) teach automated methods for item-to-item collaborative filtering (essential methods of Linden et al. US. Pat. No. 6,216,649) as applied above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is 571-272-8220. The examiner can normally be reached on 8:15am to 5:15pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 571-272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dave Robertson/
Examiner, Art Unit 3623

/Romain Jeanty/
Primary Examiner, Art Unit 3623
February 15, 2008